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Whether navigating the urban jungle, connecting corners along your favorite canyon road, traversing the globe or taking the road less traveled, the new Multistrada 1200 S is fully equipped and ready for your next adventure. With four riding modes to choose from, its exceptional engineering and advanced technology adapt at will, delivering extreme versatility, exceptional performance and refined comfort at the push of a button.

Standard Equipment for the Multistrada 1200 S:

Ducati Testastretta DVT Engine | Ducati Skyhook EVO Suspension | Ducati Multimedia System | Hands-free Ignition Full Color TFT Instrument Panel | Ducati Riding Modes | Cruise Control | Ducati Wheelie Control | Ducati Traction Control Bosch 9ME Cornering ABS | Brembo M50 Monobloc Calipers | Adjustable Seat Height | Full LED Cornering Headlights





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SEPTEMBER 2015 • VOL. 54 NO. 9

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GREATNESS COMES IN MANY FORMS

ome combination of excellence, significance, and audacity gets a bike the highest honors of the year in CW. Being really close gets it an Honorable Mention. But there are other forms of greatness or, ahem, distinction, that land a motorcycle on this list called The Ten Rest.

BEST WAY TO RIDE AS A FAMILY:

ANY URAL SIDECAR

Oh, obligatory, predictable, you say, and I agree. My two-year-old son Ian loves these, and there is nothing else like them. Wacky, useful, and smell-the-flowers slow.

BEST WAY TO BECOME WORLD CHAMPION:

KTM RC390 CUP BIKE

Helmets off to Wayne Rainey, MotoAmerica, and KTM for planting the seeds for American roadracing stars. Oh, to be 14 to 22 years old again!

BEST WAY TO BE YOUR OWN DRONE STRIKE:

BMW R1200R

Loving the retro-inspired R nineT is easy until you ride the R1200R naked standard. Amazing electronics and surprising sizzle from that flat twin. Retro has its charm, but the future BMW naked is here.

BEST WAY TO SAY ARRIVEDERCI:

APRILIA CAPONORD 1200 TRAVEL PACK

The red-hot glow of the other Italian asphalt adventurer obscures this otherwise fantastically balanced and supremely comfortable travel bike.

BEST WAY TO MAKE A CHEAP

BEST WAY TO MAKE A CHEA DUAL-SPORT EXPENSIVE:

YAMAHA WR250R

I've ridden almost everything everywhere. But I bought a used WR, threw a bunch of time and money at it, and now have my own personal perfect motorcycle I call ADV Lite. The more remote we ride, the happier I get.

BEST BIKE TO ESCAPE ON:

ANY MOTORCYCLE YOU CAN BOTH AFFORD AND LOVE

Seriously, just get on a bike. Anything that runs. Life is better.

BEST WAY TO ENSURE THE SUN NEVER SETS ON THE BRITISH EMPIRE:

TRIUMPH BONNEVILLE

We know there is a new, sportier classic coming from Triumph this fall. But we are pretty certain this new bike is meant to augment the existing line of 865cc parallel twins. In fact, Triumph would be crazy to give up on the current Bonnie and the worldwide allegiance it has gotten for the British brand. The Union Jack still flies everywhere!

BEST BEARD-STICKING-OUT-OF-YOUR-HELMET BIKE:

REVIVAL CYCLES J63 DUCATI CUSTOM

It's a rare custom-built bike that looks as good as it goes. But I was fortunate to take the Revival J63 Ducati around Mazda Raceway Laguna Seca for a few laps in conjunction with The Quail Motorcycle Gathering. Makes me wish I had the financing to commission one. A bellowing Ducati V-twin in a gorgeous chassis that actually works—beauty in motion.

BEST AMERICAN-MADE NAKED BIKE:

EBR 1190SX

EBR was to be auctioned in late July as a whole entity and put back in business. Hope so because we got an SX in hand right around the bankruptcy, and it is seriously fun, featuring loads of improvements compared to the 2014 RX we tested.

BEST WAY TO ENCOURAGE PUTTING YOUR VELOCETTE ON CRAIGSLIST:

YAMAHA SR400

I admit I am bitter about the decadeplus of mechanical punishment my peculiarly faulty '54 Velocette MSS 500cc single has levied against me. When I ride the SR400 I almost think I should move the Velo on to someone new. Almost. The SR is that much fun and dead reliable. Makes me wish I could be cured of my British addiction.

MARK HOYER EDITOR-IN-CHIEF





VEHICLES THAT BROKE 200 MPH

IN THIS ISSUE

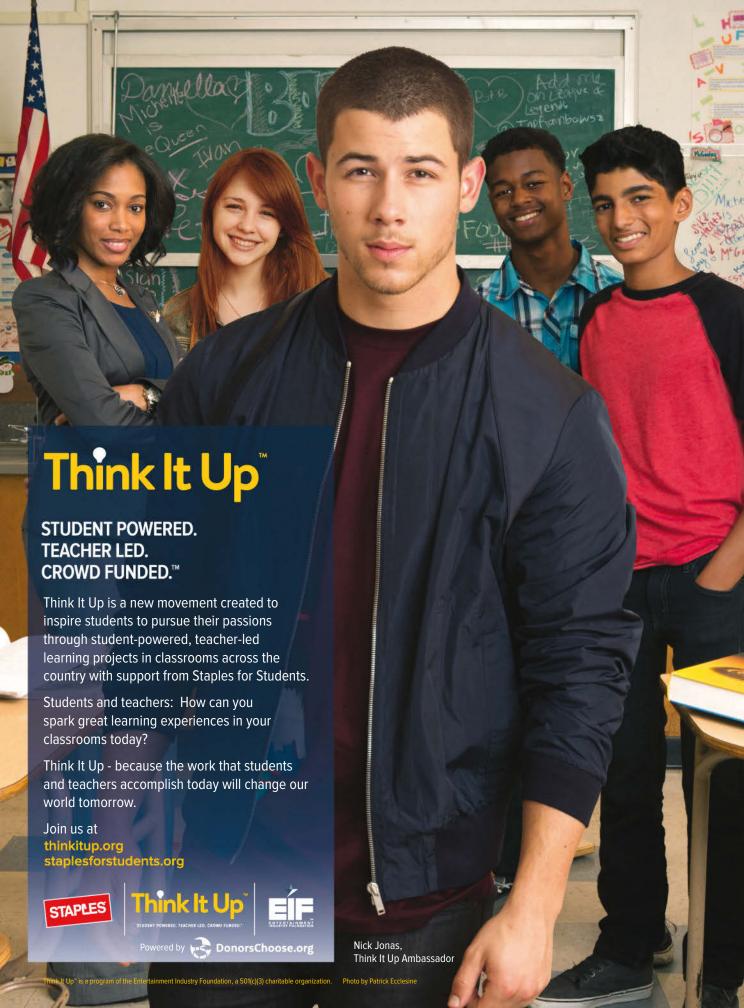
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thirty-nine

YEARS OF TEN BEST BIKES

25

APPROXIMATE NUMBER
OF MILES SPENT AT
ABSOLUTE WIDE-OPEN
THROTTLE DURING TESTING

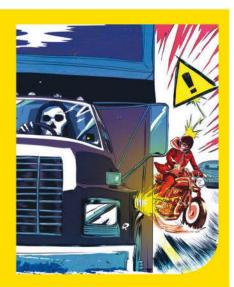


Intake

KICKSTART THE CONVERSATION

I wanted to thank Nick lenatsch for his "Avoid The Blind Spot" article in the June issue. While it is always great to hear tips for staying safe, it is refreshing to hear the tone of accountability in Nick's piece. Motorcycling is something to be enjoyed, but throughout society today, people are not held accountable for their actions, decisions, or mistakes. Putting the onus on the rider to look after his or her safety is something on which the rest of the world should take notes!

THOMAS KOBAYASHI CYCLEWORLD.COM



R1 REVIEWS

I enjoyed the review of the Yamaha YZF-R1. The chart on page 51 comparing the literbike competition was just what I like. However, I think that the quartermile times for the Yamaha, Ducati, and Honda should also be yellow. A difference of 0.03 second should not give the BMW a win. And I'd like to see a similar performance chart but for price. The difference between, say, \$17K and \$25K, is significant.

RAY WICKS WEST PALM BEACH, FL

Just finished reading your "First Ride" of the 2015 R1. I've had one for a month



and 1,500 miles, and I 99-percent agree with you regarding the throttle response in the different modes. I have just one question: I read in other publications that the redline is 14,500 rpm, yet in the manual it states it's 14,000. Please clarify.

KELLY SWEET CYCLEWORLD.COM

Kelly, you read other publications? It's 14,000.

SLIPSTREAM SLIP-UP?

Hey, guys, I'm one of the silent majority who never writes letters to the editor. But that July 2015 Slipstream photo. Really? There are enough squids and just plain old untalented riders killing themselves (and others) out there, without you giving tacit approval of people on public roads doing the signature Indian Larry stunt, which he died while performing, by the way. Just because you can doesn't mean you should. Ride safely. With your butt in the seat.

DENNIS KENNEDY CYCLEWORLD.COM

WHAT ABOUT WINNIFRED?

As a mom of three boys who look up to their dad and read the same magazines he does, I just wanted to say thank you for not putting perverted ads in your magazine. All other magazines I have to look through and tear out the ads with half-naked girls in them. I really appreciate *Cycle World* for this reason.

MARINA O. CYCLEWORLD.COM

MISCELLANEOUS RAMBLINGS

Just got my July issue. I enjoyed the reference in "Intake" to Kwai Chang Caine. It took me a minute to get the Grasshopper remark. As for the new R1, it's clear that Yamaha has upped the ante. The BMW S1000RR needs to either fold (not going to happen) or raise the bet. Lastly, regarding Tom White's vintage motocross collection: very, very cool. That Yamaha HL500 was great. Although you said the TT500 was more of a cow trailer, I seem to recall a former Grand National Champion flying at Clear Creek on one. A CZ, a Hodaka Super Rat, the first Elsinore...really good stuff.

ROBERT JONES CYCLEWORLD.COM

MX MEMORIES

I enjoyed the article "Motocross Memories" in July. I especially noticed the 1967 Greeves 250 Challenger, as I own a 1969 model that I purchased new. It is 95-percent factory original and has been stored inside for the last 30 years. By the way, the Greeves part number for the tank strap bungee cords is M27/x176.

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Comments? Suggestions? Criticisms?
Write us at intake@cycleworld.com.



THE RIDE STARTS HERE



YEAR Mot

THE NUMBERS

YEAR Moto Guzzi was founded by Emanuele Vittorio Parodi, his son Giorgio, and Carlo Guzzi in Genoa, Italy.

TOP SPEED in km/h (177 mph) of Moto Guzzi's V-8-powered 500cc Grand Prix racer, which was designed by Giulio Cesare Carcano and raced between 1955 and 1957.

CW FIRST RIDE

2016 MOTO GUZZI ELDORADO

A beautiful combination of luxury and performance **By Peter Jones**

t has an eagle in its logo and a long history of making aircooled V-twins. Its newest cruiser was designed in Pasadena, California, at the Piaggio Group Advanced Design Center by Miguel Galluzzi and is dressed in glossy black with lots of chrome, plus pinstripes, floorboards, whitewall tires, and wire wheels. The company is the third oldest in the world to be continuously manufacturing motorcycles. But it's not for riders who follow the pack while humming "Born to be Wild."

Would you, could you, own a Moto Guzzi Eldorado?

The Eldorado sports a 1,38occ, airand-oil-cooled, 90-degree V-twin that made its debut in the 2013 California 1400 models. This classic longitudinal-crank engine produces a claimed 96 crankshaft horsepower at 6,500 rpm and 89.2 pound-feet of wide-ass torque from 2,400 to 5,600 rpm.

A single 52mm throttle body feeds the fuel. The EFI has three selectable maps: Veloce, Turismo, and Pioggia, for performance, comfort, and safety (in the rain), respectively, and can be changed on the fly. The unlinked brakes feature ABS, and the adjustable traction control is labeled 1, 2, 3—the lower number is least intrusive. Cruise control is standard.

The chassis features the "elastic-kinematic" engine mounting system, allowing the engine to "float." The result is some shake at idle with ultra smoothness in every rpm from just off idle to redline. Other details include a six-speed transmission, adjustable hand levers, polyelliptical headlight, a round gauge featuring an analog tachometer, and a centered digital display for pertinent information. Braking is by 320mm dual discs up front mated to radial-mounted four-piston calipers, and a 282mm disc out back.

Seat height is set at a low 29.1 inches, and the wheelbase is a lengthy 66.7 inches, with front-end geometry set at 32 degrees of rake and 5.7 inches of trail.

There are a plethora of options such as heated grips, a windshield, billet controls, super-cool red valve covers, and much more. In the US, the Eldorado is only available in Nero







Classico, which is Italian for black and shiny. It weighs a claimed 691 pounds, with all fluids except gasoline.

First impression: The Eldorado is an engine with a motorcycle built around it. The cylinders cut into the fuel tank, and the rider's knees are but an inch from each combustion chamber. There's no hiding this big engine from view at any angle, even when you're sitting on the bike. But there's no reason to hide it.

Fired up, the Eldorado chugs side to side for an obvious reason. But due to damping, the vibration

completely disappears above idle. In fact, this might just be the smoothest-feeling Vtwin in any cruiser chassis.

Once the Eldorado gets rolling, it's an experience of contradiction. Generally, riding a big cruiser briskly down a winding mountain road makes you feel like you're doing something the machine doesn't like. But the Eldorado likes it and is particularly at home

where roads get fun. It handles even the tightest of switchbacks with the easiest effort. This is particularly surprising considering the length and weight of the bike.

Comfort is a matter of feel and feedback. When it's right, a motorcycle behaves with a natural, intuitive ease, and that's exactly how it is to ride the Eldorado. This Guzzi has some of the highest horsepower in the class. This is well appreciated when passing cars on short straights. The power is full access—no waiting, no downshifting, no nervous wondering.

The 7,000-rpm redline provides

a nicely wide rev range, adding to the bike's appeal on or off the interstates. Braking is smooth and powerful for such a heavy machine, and the chassis is well sprung and damped, eliminating any undue weight shifting when transitioning from throttling to braking to cornering.

As for riding expressways, the Eldorado is a tour-all-day machine with supple yet effective suspension, totally adequate wheel travel, and a well-engineered big seat. It took the

biggest pothole in Italy to get the bike to bottom out. The pulledback bars are well positioned for a relaxed riding position, and the fit and finish are world class, from the pinstriping to the chromed "windows" on the tank.

There might not be another big crusier with this handling, power, suspension, electronics, features, comfort, or class. In short, the Eldorado is majestic and elegant, a beautiful combination of luxury with performance.

In the market, the only thing the Eldorado has going against it is this: It's not a Harley.



The Moto Guzzi

Media Platform (MG-MP) is optional. This app allows you to display a speedometer and tachometer, plus engine power and torque, instant and average fuel consumption, average speed and battery voltage, and longitudinal acceleration and trip computer on your smartphone. When the fuel light comes on, MG-MP locates gas stations. It can also locate the bike, as long as it's parked where you left it. Additionally, no longer does it take a passenger punching you in the back to suggest slowing down. The "Grip Warning" displays traction control in real time to road conditions, alerting of poor grip. A roll-angle indicator uses the phone's gyroscopic abilities and algorithms developed for Moto Guzzi.



2016 MOTO GUZZI ELDORADO

ENGINE TYPE

DISPLACEMENT

SEAT HEIGHT

FUEL CAPACITY
5.4 gal

CLAIMED WEIGHT

PRICE \$15,990



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CW PRODUCT SPOTLIGHT

ARAI CORSAIR—X Five things you need to know By Matthew Miles

Two words: round and smooth. Starting point for the Corsair-X is Arai's customary egg-shaped shell. Company engineers call this "R75." defined as a continuous, convex curve of a minimum radius of 75mm. Should the helmet glance off an object, energy-absorption capacity can be reserved for a second, third, or even fourth impact—what Arai calls the "realities" of a crash.

A fundamental difference: The Corsair-X has a new face shield system. This complicated yet elegant design uses Arai's Variable Axis System (VAS) that lowers the operating mechanism, increasing the area above the side pods by an average of 24mm for a rounder, smoother surface along the critical Snell test line.

3 Let's face it: Many Americans have pronounced facial features. Comedian Jay Leno, an Arai wearer, is one well-publicized example. Arai addressed this challenge by extending the chin bar of the Corsair-X by 3mm and reshaping the liner to give the wearer more room and make the helmet feel less claustrophobic.

Also new: the central top-of-shell intake vent. While the previous Delta 5 vent had a lower, wider profile, the new design pulls in more air and is less sensitive to the rider's position on the motorcycle. Two-stop "slider gates" close more securely than the previous flappers, which helps reduce wind noise.

in its closed

position.

5 An added bonus: A secondary benefit of a smooth, round shell is that the helmet remains aerodynamic and quiet even when you turn your head. Small bulges in front of the air intakes in the 20mm-longer diffusers improve flow by a claimed 19 percent. Straightening the diffusers has enhanced overall stability.





FAST FACTS

- → An Arai shell expert (15 in the world) can produce either 110 fiberglass shells each day or one carbonfiber shell.
- → Helmet molds are machined inhouse from steel ingots.
- → Strong shell, soft liner: Arai has 10 EPS liner-density options and engineers usually favor the softest possible combination for best energy absorption.
- → Each full-face Arai helmet has anywhere from 27 to 30 highly individual components, each precisely cut and shaped.
- → Prepping, applying, and sanding the base coat of paint for each shell requires five days of hand labor.
- → Arai employs 280 people at its main plant in Ohmiya, Japan; only three are certified to install chinstraps.
- ← Corsair-X, right, has smaller sidepods for a rounder, smoother shell. New top vents draw in more air.







SEPTEMBER 1990

- → The coverline "Giant Killers" couldn't have been more appropriate reflecting back to when I read this article for the first time all those years ago. The Japanese-market Honda CBR400RR and Yamaha FZR400RR SP sportbikes that were featured might as well have been Ferraris; even if I could have found a gray-market example, I never would have been able to afford one.
- → The aforementioned bikes were definitely a sign of things to come, as the super-hot 400cc market in Japan dictated where American-market 600s
- were headed. Aluminum frames, carbon-fiber exhaust cans, advanced suspensionall of these were ahead of their time in 1990, at least on production bikes. Also featured were the Suzuki GSX-R400, Honda VFR400R, Kawasaki ZXR-400R, and a whole pile of street-legal, Japanese-market 250cc two-strokes.
- → Triumph fans could also find a trio of customs and a preview of the born-again Hinckley Triumph resurrected by John Bloor in the English Midlands. At that time, as the article concluded, "The company is said to have

no immediate plans for selling its new motorcycles here." They finally arrived in 1995.

- → Yes, even 25 years ago Peter Egan was enamored with British steel. In this issue he outlines the restoration of his 1967 Triumph TR6C.
- → In the early '90s, dualsporting was big and the machine choices vast. Seven dual-purpose bikes from 349cc singles to a 980cc BMW twin bookended the options, which were highlighted in the story called "Alternate Routes."

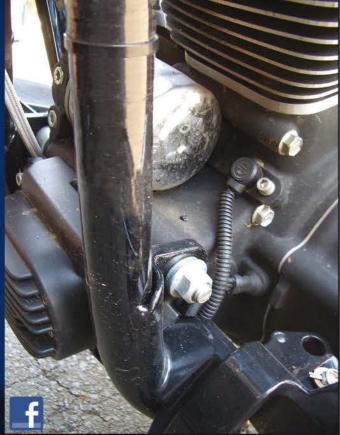
-Blake Conner

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Those dark, hidden places can kill your steel. Dirt builds up and traps moisture. Next thing, corrosion starts. S100® Total Cycle Cleaner is the answer. Its creeping power can get to places you can't reach or even see. Then its penetrating action zaps even the toughest stains. (It's even got a corrosion inhibitor so it washes safely.) Ordinary washes and cleaners can't do all that! No wonder it's been the favorite of bike makers themselves for over a generation. Protect your expensive investment with the best cleaning it can get! Find it at better bike shops.

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NEW IDEAS

BY WIRE

Five ways to enhance your ride **By Blake Conner**













CAPTURE IT ALL

2

Those wanting to take POV filming to a new level might consider the **360fly** (\$399, available in August) single-lens camera that captures video in a 360-degree format. During playback, you can drag the cursor on screen to view all the different angles captured. This 2.4-inch water-resistant sphere can be mounted just about anywhere.

→ (412) 922-6002 360fly.com



PACK MENTALITY

Staying connected on group rides has been revolutionized. Packtalk (\$329.95 single/\$579.95 pair) from scala rider features Dynamic Meshwork Communication (DMC), allowing up to 10 riders to talk within a 3-mile range. Settings can be changed via SmartSet app. Packtalk can communicate with any other brand or model of intercom.

→ (800) 488-0363 cardosystems.com



ADV PHONE HOME

If you like your adventures way off the beaten path but don't want to lose contact, the Iridium Extreme (\$1,300-\$1,500) satellite phone is a great choice for motorcyclists. Water-, shock-, and dust-resistant unit might look like a '90s flashback, but it's packed with features such as GPS positioning, SMS capability, tracking, and an SOS button. → (866) 947-4348 iridium.com



WIRED

Communication devices are commonplace, so it's no surprise to see more helmets prewired with speakers and a microphone. Schuberth's M1 (\$550-\$580) features an integrated sun visor, while the optional Schuberth Rider Communication System (\$200 single/\$400 pair), snaps into the back of the shell.

→ (949) 215-0893 schuberthnorth america.com



MOTOSOCIAL

The new app from Rever is a social environment for motorcyclists. Available for Apple and Android devices, it allows users to explore roads, log rides, gather data (even racing circuits), and share routes. Upgrading to a premium account (\$5.99 month/\$59 year) gives access to Butler Maps' content in addition to enhanced multi-user features.

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RACE THE BEST, BE

Race across 15 different tracks, in 4 competitive gamemodes. Ride on 12 different bikes & ATVs and choose from 16 diverse characters.

It's the one and only Dirt Rider Game, available for FREE on Android &















KNOW YOURSELF TO KNOW YOUR BIKE

THE PERFECT BIKE

Match your personal archetype to your perfect bike type **By John L. Stein**



he Japanese have a term, "jinba ittai," which translates to, "the rider and horse as one." Some years ago, Mazda picked this up to describe how it wanted the MX-5 Miata driving experience to feel. But the concept really is more suited to motorcyclists, who should absolutely choose the correct "horse" for their type of riding. Imagine André the Giant flogging a race-kitted Vespa LX 50 through the Carousel at Sonoma Raceway. That obviously doesn't make much sense, nor does the vision of 4-foot-8 Snooki caning a Triumph Rocket III along the Tail of the Dragon. Borrowing from Chevy Chase in Caddyshack, "To be one with the horse, you must be the horse, Danny."

Virtually all spec charts show curb weight and seat height, but these are only part of what determines how easy a bike is for different riders to handle. Big, heavy cruisers often feel lighter than they really are due to the leverage afforded by their wide handlebars, their low seating, and center of mass. However, despite a sportbike's much lighter weight, stretching over its tank to reach the low clip-on handlebars might actually be harder for some riders. So who are you, and what is your best horse? Here are four handy strategies for matching your personal archetype to your perfect bike type.

1. Size matters. Get a bike that matches you dimensionally, including the reach to the bars and pegs, as well as seat height. In a car, the seat, steering wheel, and sometimes pedals adjust to fit 95 percent of the population. Most bikes don't, so choose carefully.

2. So does weight. Honda's Grom weighs 225 pounds and Indian's Roadmaster tips the scales at 930. Your ideal is somewhere in between, so find a bike whose mass you can safely handle—including picking it up when it goes all flounder on you.

- **3. Pick perfect power.** From a safety standpoint, the amount of power you need depends on your riding. For my money, 800cc and up lets you beat city traffic, claim-jump any freeway lane anytime, and execute quick passes on the highway.
- **4. Tailor to talent.** Choose a bike whose skills match your own. For a Walter Mitty, wrestling an R1200GS down a slippery trail and through an icy creek might be a whole lot of no fun. But if you're truly a wild hog, get one!





UNITED BY INDEPENDENTS

FUELISHLY COMPLICATED

ENERGY SOURCES VERSUS ENERGY CARRIERS BY KEVIN CAMERON

he fuel that most interests motorcyclists is gasoline because that's what almost all motorcycles burn. But the fuel that drives our lives is diesel, powering farming, all medium and heavy trucking, all the railroads save for the Northeast corridor, and all coastal and international shipping. If we add the lighter fractions based on 9 to 13 carbons per molecule, we include the kerosene-like fuels (Jet-A, JP-4) that power aviation. In Europe, some 60 percent of new cars are delivered with diesel engines.

This is why, when synthetic fuel production is considered, the product in mind is always diesel.

I well remember being a small boy in my parents' car, driving past the New Jersey refineries and seeing the ghostly wavering flames atop their flare stacks. Even today, petroleum gases are flared in some areas like Nigeria. Natural gas is highly valued today because its use allows power companies to meet emissions standards much more cheaply than they can with coal.

The big question is this: How do you get it from where it comes out of the ground to the point of use? Pipelines are one answer—much European electricity is generated from Russian gas. India and China would love to have gas from the rich Caspian Sea fields, but the necessary pipelines would have to be built across areas infested by unpleasant men with automatic weapons.

One answer is to refrigerate and compress natural gas into a liquid at 260 degrees Fahrenheit below zero then pump it (after carefully cooling the receiving tanks and all pumping apparatus and plumbing) into glorified spherical "thermos bottles" aboard special LNG (Liquefied Natural Gas) ships. Such ships, crewed by extremely careful non-smoking staff, then carry the liquid across the wide ocean without running aground or

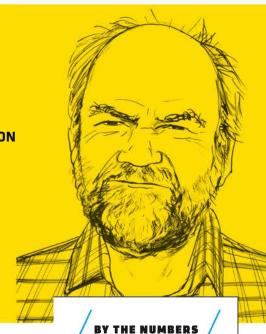
turning over in cruise-ship fashion. On the receiving end, there must be matching high-tech facilities and procedures for safe unloading and storage, costing hundreds of millions.

There must be endless permits and licenses, backed by learned deliberations, that say the chance of distressing accident or terrorist action can be reduced to an acceptably small value. Even with such deliberations, not all of us will agree, leading to op-eds in top newspapers, picketing, and lawsuits. Good luck.

But just as soon as everyone in the boardroom nods and signs off on funding all this, hydraulic fracturing, or fracking, comes along (even with all its controversies) and provides so much gas in the US that drilling rigs are now going back into storage at record rates. Too much gas!

Another way to transform natural gas into a liquid is to employ "GTL," or Gas-to-Liquids chemical conversion. Using high pressure, heat, and catalysts in the usual zillion-dollar plant, the natural gas can be reformed from its natural one-carbon state into species based on long carbon chains with 13 to 22 carbons each. GTL yields a wonderful synthetic diesel fuel that ignites easily in engines (high cetane rating), burns more cleanly than natural diesel (because it contains no rugged, combustion-resistant, soot-forming carbon ring structures), and, best of all, contains zero sulfur (so it cannot form sulfur dioxide and sulfuric acid when burned). Such diesel commands a substantially higher price in the market. Hmm.

But just as our boardroom execs set aside their half-eaten doughnuts to reach for their pens, news comes of Europe's new awareness of health hazards from diesel emissions. The same thing happened in the US in the 1980s, when a researcher discovered that sitting, adsorbed, on the surfaces of diesel exhaust carbon particulates are some amazingly carcinogenic compounds based on car-



67

PERCENTAGE OF US
NATURAL GAS PRODUCED
BY WELLS THAT ARE
HYDRAULICALLY
FRACTURED

LNG tanker (side view)

260,000

CAPACITY, IN CUBIC METERS, OF THE LARGEST LNG TANKERS, WHICH ARE LONGER THAN THREE FOOTBALL FIELDS

1,000

AMOUNT OF AUDI E-GAS, IN METRIC TONS, PRODUCED ANNUALLY. THAT'S ENOUGH TO POWER 1,500 AUDI A3 SPORTBACK G-TRONS, EACH FOR 15,000 KILOMETERS. bon ring structures.

Hold everything! Just as a US rush to economical diesel power was beginning, a screech of regulatory brakes stopped it. Now, to meet US emissions, diesels must be equipped with self-regenerating exhaust particulate (soot) filters, and with chemical systems to convert nitrogen oxides (nastiest of all smog-formers, nitrogen oxides are formed at high combustion temperature) into harmless nitrogen and oxygen. This costs money, adding a claimed \$7,000 to the price of a diesel-powered pickup. Will Europe now adopt similar emissions standards to protect its citizens, as Americans are now protected? Huddled masses, yearning to breathe free? More difficult choices to consider in the hoardroom

So maybe there's no surprise when Audi (yes, the automaker who owns Ducati) announces a process to make synthetic diesel by "un-burning" the products of combustion—carbon dioxide and water. Yes, you have to put in more energy to make the stuff than the motorist, farmer, ship captain, or pilot releases when it is burned, but on the numbers presented (and if large amounts of low-cost electricity somehow become available) it could be economically competitive with things like drilling for oil under the north polar ice cap (Ice cap? Isn't all that melting away as we look?) or pacifying entire countries filled with disagreeable armed men. Even though the necessary synthesis equipment will cost hundreds of millions.

Low-cost electricity? Now our boardroom power-dressers reach for their handy desk references on alternative energy. At present, to generate all US electricity from wind would require building 23 times more wind turbine capacity than was on-line in 2014. Using solar would require 250 times more capacity than available last year. To do it with hydroelectric would require 17 times more unpopular, environmentally inadvisable dams. Laptops click into calculator mode. General sighing.

Audi's process is but the latest in a long series of synthetic fuels processes, dating back at least 100 years. Many of these begin with coal as their source of carbon, but all seek to push carbon and hydrogen "uphill" in an energy sense, to form liquid fuels such as methanol or petroleum liquids. In this sense, such synthetic fuels are not energy sources. They are energy carriers, for

much of the energy in synthetic fuels comes from the process heat and pressure consumed in creating them and, in the case of the Audi process, the significant electricity required to liberate hydrogen from water.

Looks like it will be a working lunch for our boardroom group—there is lots to ponder. And it won't be a free lunch either.



THE GREAT UNCON-FORMITY

CUSTOMS BRING TECTONIC SHIFTS TO MOTORCYCLING
BY PAUL D'ORLEANS

e had guests for dinner, Suzie Heartbreak and I, and brother Scott spun tales of his rafting expeditions in the Grand Canyon's geologic depths.

The canyon's many-hued strata are a time line of compressed ages, but Scott threw a wrench in my reckoning. "Near Lava rapids you pass the Great Unconformity." I wait-waited the conversation; how apt a label for a century of custom-motorcycle building.

Change requires unconformity, and that's where custom builders work, wobbling between established genres and new ideas. They're outside the mainstream yet impact an entire industry, at times steering the boat from the rear. In the early days, burning questions of the "ideal" machine bred a lot of talk, sketches, and customized bikes. Harold "Oily" Karslake might have been patient zero, building his "Dreadnought" in 1903, which pioneered a low-mounted, sprung saddle, a powerful engine, and no bicycle pedals—the first pedal-less safety-frame motorcycle. Oily later engineered George Brough's Superiors, plus of course a custom Brough, the "Karbro Express" with a 1,500cc engine, monstrous in the day. Karslake's combination of a bigger motor and catchy name is evergreen, and his ideas shaped the industry.

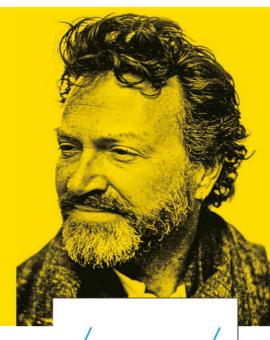
Great waves of customization followed. The Cut-Down of the late 1920s was the first uniquely American style: Harley-Davidson "J" twins with shortened and lowered frames. Add a tuned engine, and the Cut-Down became the hottest bike around, lighter, lower, and better handling than stock. H-D offered its first "racing" twin-cam engine for the road in '28, the JDH, and JDH Cut-Downs were the fastest American bikes prewar. Faster

than the EL Knucklehead introduced in '36, which embarrassed H-D brass, who promptly had them outlawed from AMA competition. JDH riders wore "outlaw" as a badge of pride...the start of all that.

Cut-Downs were American café racers long before the term and pushed the industry to tighten up their lines. The name "café racer" was coined in 1950s England, where riders converted road bikes into racer look-alikes. By the '60s, factories were building their own versions, even slapping trendy checker tape on production bikes. The Italians were far ahead though, seemingly forever building hot rods, but definitively stole the Brits' stamp on the café trend by making the fastest motorcycles in the world in the '70s; first the Ducati 750SS, then the Laverda Jota. It was the apex of the café trend, and customizers invented the style.

Harley-Davidson resisted nonconformists for decades; it took young Willie G. to incorporate custom cool. First he built a café racer (the XLCR) then addressed the chopper craze with the Low Rider, transforming custom stance into a new genre—the cruiser. H-D even subtly embraced the outlaw thing with an advertising shift, hinting that anyone could buy a little V-twin badass.

Nowadays, smart factories cultivate custom builders as an externalized R&D. BMW, H-D, and Yamaha dole new bikes to small shops around the globe, gaining press attention and reflected grooviness. BMW successfully flipped its dependable-appliance image by working with top-tier stylists like Roland Sands and hiring a Swedish chopper dude (Ola Stenegard) as head bike designer. Thus the Great Unconformity wobbles toward the mainstream...but never quite settles.



BY THE NUMBERS

1930
THE RADICAL

DREADNOUGHT
IS BUILT-THE FIRST
CUSTOM?



HARLEY INTRODUCES THE XL CAFÉ RACER



2013
ROLAND SANDS
UPDATES THE
BMW R90S

TOMTOM® RIDER THE ALL NEW



www.tomtom.com/rider Rider lets you create the 'Plan a thrill' feature





we know, we technically should have called this story "Burn & Turn" because we conducted our straight-line acceleration tests to 180 mph (and beyond) at the Lemoore Naval Air Station *before* dragging knees at Buttonwillow Raceway Park. But the Navy folks graciously fit us in when they could, and, besides, we think "Turn & Burn" rolls off the tongue much better. It also beautifully conjures up images of fighter jets in action.

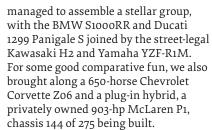






And at NAS Lemoore, there are plenty of them. In fact, the Navy's entire West Coast fighter/attack capability of F/A-18 Super Hornets is stationed at this huge facility in the San Joaquin Valley in Central California. The station is effectively a city, a place where Navy pilots sharpen their skills by flying regular missions and practicing carrier landings on the smooth, rubber-streaked 3-mile runways that once served as emergency landing strips for our now-defunct space shuttle program.

Our mission was simple. As in our original "Turn & Burn" in our July 2008 issue, we gathered a crop of current hyperbikes and unleashed them on runway 32R in a speed contest to hit 180 mph and peak velocity. Unfortunately, the supercharged Kawasaki H2R trackbike, the real catalyst for this test, was not made available for us to test (see sidebar). Nevertheless, we still



Road Test Editor Don Canet, no stranger to speed, would ride each bike, while Derek Hill-former F3000 driver, son of Phil Hill (1961 Formula 1 World Champion), and a huge motorcycle enthusiast-was our shoe. Cars and bikes were stock, but we allowed the motorcycle companies to equip their machines with any optional trackonly ECUs, in the interest of best performance. However, once we saw that the Panigale 1299 S had arrived without mirrors and license plate (and Ducati didn't even have the parts back in its Sprinter), we allowed all bikes to run that way. Also, the BMW S1000RR was fitted with an accessory Akrapovic pipe due to bad communication on our part, but all other bikes ran stock exhausts.

So join us now for our test, which took place on a mild spring day, with temps topping out in the mid-70s. Elevation at NAS Lemoore, for the record, is 230 feet, and the wind was mild all day. Our cars and bikes would launch from the north end of runway 32R then disappear into a shimmering mirage with engines audible the whole way. At 180 mph, they're gobbling up nearly a football field every second, and all the while, GPS satellites communicated with our VBox test equipment to capture all the crucial data. Now, our vehicles, in increasing level of performance.

Chevrolet Corvette Z06

Price (as tested): \$85,565 Weight: 3524 lb. Horsepower: 650 hp at 6400 rpm 0–180 mph: 56.64 sec. Distance to 180 mph: 9704 ft.

There's one number to associate with the aluminum-chassis Corvette Zo6: 650. As in 650 hp, 650 pound-feet of torque. That's right: The supercharged 6.2-liter LT4 V-8 is an exceptionally potent mill, and wheelspin constantly beckons.

We, however, wanted this Vette—a stock Zo6 coupe with a seven-speed manual transaxle—to hook up as best as possible, and Derek Hill, after a few practice runs, opted to launch the car











with the PTM traction control and launch control shut off, knowing full well that if he got too much wheelspin, it would take seemingly forever for those massive 335-width Michelins to come back down to the point of traction.

It worked well. Our Zo6 shot off the line with minimal rubber smoke and only a hint of squat before hitting 60 mph in 3.68 seconds and blasting through the quarter-mile in 12.1 seconds at 121.22 mph. While not *Car and Driver* quick, this was a solid run, Derek shifting with the deliberate mechanical sympathy of an owner.

The 56.64-second blast to 180 mph, however, was comparatively glacial. Here's the deal: Approaching 180 mph, the Zo6 was near its terminal velocity, and those last few mph came agonizingly slowly. Derek tried to hit 180 in fifth, on the rev limiter, but the Zo6 topped out at 179.4, which meant a time-consuming upshift to sixth was needed. "It was caught between fifth and sixth," Derek explained. "It took forever to claw its way back to 180."

Nevertheless, Derek was impressed with the big and thunderous Zo6, saying it felt stable at speed with the adaptive MagneRide suspension in the Track Mode's Sport setting. And just think: This seriously good everyday supercar, a pulse-quickener of the first order, is backed by an impressive five-year/100,000-mile powertrain warranty.

Ducati 1299 Panigale S

Price: \$24,995 Weight: 406 lb. Horsepower: 177 hp @ 10,700 rpm 0–180 mph: 19.43 sec. Distance to 180 mph: 3659 ft.

The Ducati, we're sorry to report, is the only bike in this test that was not as quick to 180 mph as the Kawasaki ZX-10R that won our original "Turn & Burn" test in 2008. What gives? Like the Corvette, the rumbly V-twin Italian was very near its terminal velocity approaching 180, so it took an extraordinary amount of time (and real estate) to reach that speed.

But if you look at the quarter-mile

sprint, the 1299 Panigale S was a rocket, one of only two bikes to break the 10-second barrier. Prior to his timed runs, Canet spent a good chunk of time fiddling with the wheelie control and traction control. Wheelspin on the grippy concrete wasn't a problem, but because the front wheel would come off the ground at initial launch and stay aloft for a long while (and spin significantly slower than the rear), it would trip an error code that would need to be reset by our Ducati technician. "My best runs were when I tempered my throttle hand," explained Canet, who said the wheelie control lets the 1299 stand up steeply in second gear. "By the top of second gear, you're over 100 mph." Traction control, Canet concluded, hurt the launches.

So, for his best runs, Canet switched all electronics off, launched the big Panigale at 6,000 rpm, and used the clutch to keep revs in the thick of the powerband, somewhere between 7,000 and 8,000 rpm. "With the Duc," Canet explained, "you short-shift it, set it back down, and repeat. It has excellent



JEFF ALLEN

*** THE LIMITS OF **ACCELERATION**

Fighting the wheelie and other issues when motorcycles take on cars

Given unlimited engine power, we tend to think of acceleration being limited only by how sticky our tire is, but there is a more fundamental limit-even if we have unlimited power and unlimited tire grip. That limit is chassis geometry. At some level of acceleration, the front wheel(s) will lift off the pavement, and that is the maximum acceleration possible.

Why? Because the higher the front end rises, the easier it gets to lift it further, until the taillight is



broken. Or worse.

Max acceleration comes with the front tire barely kissing pavement. When building a dragbike, we raise this acceleration "wheelie limit" by (1) using the widest, stickiest tire allowed; (2) by moving major masses (engine and rider) forward and lowering them as far as we

can; and (3) by using a wheelie bar. Have a look at any Pro Stock motorcycle dragbike.

Yet when we compare practical sporting motorcycles with fast automobiles, we are comparing a vehicle with a short wheelbase (55.3 inches) and high center of mass (something around 21 to 22 inches is necessary for cornering clearance) to a vehicle with a much longer wheelbase (105 inches) and with its engine located Formula 1-style, barely above the pavement. This means that the car's wheelielimited rate of acceleration is much higher than that of the bike.

A powerful production motorcycle, providing two wheels, an engine, and a place to sit, can achieve a fabulous power-to-weight ratio of around 3.4 hp per pound. This McLaren P1 is less fabulous at 3.8. Yet even with this difference apparently in favor of the bike, the car pulls away. This is because it can put more power behind each square foot of aerodynamic frontal area and because while the car is fully streamlined, the motorcycle's streamlining ends with its fairing. And the car is putting power down with two wheels. -Kevin Cameron

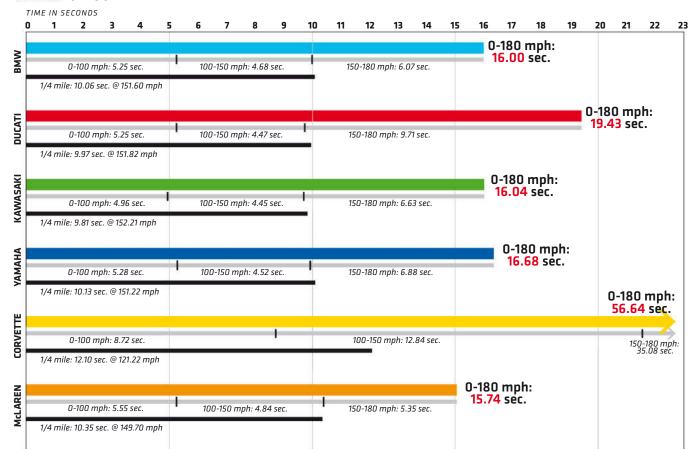
*** ACCELERATION ANALYSIS NAVAL AIR STATION LEMOORE

Big picture, it's easy to see that the McLaren P1 smoked everybody in the blast to 180. But there are other points worth noting: All the bikes, for instance, were quicker to the quarter-mile and 150, with the supercharged Kawasaki H2 leading the way. Where the P1 really starts to shine is from 150 to 180, when its better aero comes into play and the car slices through that performance window nearly three-quarters of a second more quickly than the fastest bike, the BMW S1000RR. Incidentally, the Corvette Z06 hit 150 mph in 21.56 seconds, but it took it another 35.08 to reach 180, compared to only 5.35 for the P1. Yes, the P1 is lighter and more powerful, but it's important to note that the Z06 topped out at 179.4 mph in fifth (at 43.56 seconds) and needed a time-consuming shift to sixth to reach 180. If the Z06 hadn't needed that shift, its 180 time (and distance) would have been significantly better but still no match for our four superbikes. —Andrew Bornhop

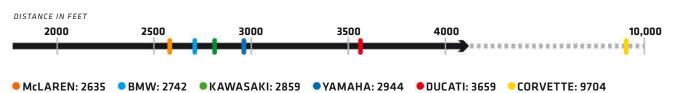


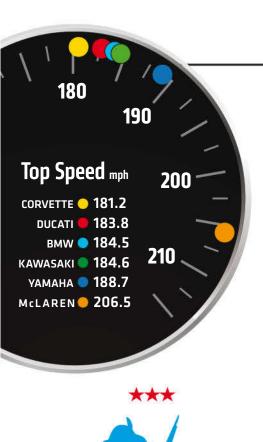
EFF ALLEN

★★★ 0-180 MPH



★★★ DISTANCE TO REACH 180 MPH

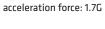




F/A-18 SUPER HORNET

acceleration force: 1.3G







PRO STOCK DRAGBIKE

acceleration force: 2.75G



acceleration force: 5 to 6G

ANTI-BALLISTIC MISSILE

acceleration force: 100G





A BRIEF SURVEY OF QUICK

Zero to 7,612 mph in five seconds? Sure.

When I graduated from high school, 0 to 60 in 10 seconds was high performance. That was a little more than a quarter of a G (which is acceleration of 32 feet per second, every second). Commercial jets take about 26 seconds from brake release to rotation at 180 knots (something like 300 feet/second), which gives us about 0.36G.

Then we get to street-operable highperformance rides. Aprilia's RSV4 gets to 60 in 2.7 seconds, or just over 1G. This is a common number for supercars as well.

We know that the thrust of any jet fighter that can climb straight up has to be greater than its weight, which means it can accelerate at more than 1G. But the engine(s) of a Mach 2 aircraft deliver limited propulsive efficiency at 0-to-60 speeds (that's why we don't use rocket motors to do our spring plowing). So their 0-to-60 times are comparable with highend wheel-driven production cars and bikes. Good top speed though.

A Formula 1 car on very short gearing might do 0 to 60 in as little as 1.6 seconds (1.7G), but normal numbers are 2.1 seconds (1.3G) to 2.7.

Moving from the remarkable to the fantastic, a Pro Stock motorcycle does 0 to 60 in roughly 1 second, or 2.75G, showing the value of a big sticky tire and a bike with its weight low and far forward. And a wheelie har

At the end of the scale for wheel-driven vehicles are Top Fuelers, reckoned to reach 60 mph in just over *half a second*, for an acceleration of 5 to 6G.

Vaulting from fantastic to ridiculous was the Martin "Sprint" Anti-Ballistic Missile, designed for close-in intercept of incoming ICBMs that had got past the "Spartan" system. It darted out of its silo at 100G covering the first quarter-mile in nine-tenths of a second, tripping the lights at 1,960 mph and reaching Mach 10 (7,612 mph) in five seconds. Sprint was briefly deployed in the 1970s.

We soft humans lose consciousness at moderate accelerations. We hear of combat pilots pulling 8 or more G, but essential things start coming loose inside us at 30G. We'd be squashed by a ride in Sprint then become hot plasma in the fireball of its W-66 nuclear warhead. —Kevin Cameron

midrange, so you can short-shift it without having it fall flat. You can't do that with the inline-fours."

Yamaha YZF-R1M

Price: \$21,990 Weight: 419 lb.

Horsepower: 173.3 hp @ 13,610 rpm 0-180 mph: 16.68 sec.

Distance to 180 mph: 2944 ft.

With the glistening silver and blue YZF-R1 R1M, Canet was instructed by the Yamaha rep to have engine power in its max setting, TC in its least intrusive mode, launch control at its most aggressive level, lift control set to 1, and suspension in Auto 3. Then, after pinning the throttle to have the electronics keep the engine at a constant 10,000 rpm, Canet would release the clutch and modulate it as the R1M shot down the runway, throttle pinned the whole way. The runs looked superbly consistent, with Canet banging upshifts as the front wheel skimmed above Lemoore concrete for what looked like a quarter-mile.

"I like the launch control strategy of this thing and the tall first gear," Canet remarked. "It never feels like it's going to come over on you. It keeps the front wheel just skimming the ground. And the assist clutch has none of the chatter and grab I'd feel on the old Ris."

Because the R1M's trick 999cc four-cylinder doesn't have the thick midrange power of the supercharged H2 or the big Ducati twin, Canet said it was best to keep the R1M above 9,000 rpm. "But to tell you the truth, I'm not even noticing the shift lights," he explained. Of note, the Yamaha YZF-R1M, with its track-only ECU, was our slowest bike in the quarter-mile (by a mere 0.07 second), but its ultimate velocity of 188.7 mph was the highest peak speed reached by a motorcycle at Lemoore that day. "It's a piece of cake getting tucked in on that thing," Canet said with a grin.

Kawasaki H2

Price: \$25,000 Weight: 501 lb.

Horsepower: 189.8 hp @ 11,090 rpm 0–180 mph: 16.04 sec.

Distance to 180 mph: 2859 ft.

While launching the Yamaha YZF-R1M was a relative walk in the park, the supercharged Kawasaki H2 was entirely different. "It's hard to feel what it's going to do because of the nature of the engine and the boost," Canet remarked





RATHER THAN MAKING THE **SUPERBIKES** LOOK BAD, THIS MILLION-**DOLLAR** BRIT UNDERSCORES THE HUGE BANG-FOR-THE-BUCK **ADVANTAGE** THAT MOTORCYCLES MAINTAIN OVER CARS.

after a few practice runs in which he experimented with the launch, traction, and wheelie control systems. On some runs, the H2 felt planted in third gear, able to take full throttle. On others, Canet said the bike wanted to snap its front wheel up way too high for comfort.

After working with the Kawasaki tech on how to best set up the H2, Canet decided to launch the heavy 501-pound machine with all electronics off. That way, he'd have full confidence for the whole run and not worry about how much front wheel lift would be allowed in each gear by the particular settings he had chosen for that run.

With everything switched off, he launched the H2R at only 5,000 rpm, leveraging the supercharged fourcylinder's midrange power. It worked. Canet's runs looked much smoother, with the rear hooking up beautifully and the front barely aloft, both under the control of his skilled right wrist. What can we say? With a full day of testing on a bike as electronically complex as the H2, we might have found an ideal setting for the conditions. Or we could simply hand control to Canet and watch a human computer handle it with the aplomb of a guy who's been testing bikes for decades.

The choice was easy for us, and at the end of the day, the H2 was quickest bike to 60 and 100 mph. And it hit 180 mph in only 16.04 seconds, 1.2 seconds more

quickly than the winning ZX-10R in our first visit to Lemoore. Impressive. One can only imagine what the track-only H2R, with 100 more horsepower, would have managed on this glorious runway.

BMW 51000RR

Price: \$15,500 Weight: 416 lb. Horsepower: 181.7 hp @ 13,600 rpm 0–180 mph: 16.00 sec. Distance to 180 mph: 2742 ft.

Canet did his first timed run of the day on the howling BMW S1000RR and came back wide-eyed. "That thing's gnarly," Canet said from inside his Arai. "It wants to wheelie forever. I can't give it anymore stick. I don't think I set the front end down until I was doing about 140."

Contemplate that for a moment. As with the Kawasaki H2 and Ducati Panigale, Canet chose to test the Beemer with launch control, traction control, and wheelie control off. "For drag launches, these systems hurt the BMW's performance out of the hole," he said. "They cause the bike to cut power and bog."

With everything switched off, Canet said he couldn't be aggressive with the throttle until third gear, when he could really wring it out. But even in fourth gear, snapping the throttle open would make the S1000RR stand right up. "Makes it pretty fun," remarked our

★★★ WHERE'S THE H2R?

What if you threw a party and the Ninja of honor didn't show? It seems to us that the very reason to build a supercharged, 300-plus-horsepower closed-circuit-only motorcycle is, at the very least, to crush any supposed competition in a straight-line test of acceleration and top speed.

The Kawasaki Ninja H2R was the very reason we asked the United States Navy to shut down its beautiful, expansive 3-mile runway at NAS Lemoore and arranged for all these other hyper-performance vehicles to rip their way into the laws of physics.

Unfortunately, Kawasaki decided to bring only the H2 streetbike. The official statement: "Kawasaki [USA] is currently in possession of a single H2R, therefore loans for media events are limited. The H2R is currently scheduled for high-speed testing by Kawasaki R&D. Once this testing has been completed this model will become available for additional testing by media outlets."

This note came after sister publication *Sport Rider* conducted acceleration and high-speed testing with the H2R that saw the bike hit 204 mph in a half mile.

To help us secure the H2R, we offered to have Kawasaki use its own rider and not run for top speed. But Kawasaki still chose to not participate.

As for the H2 streetbike not being in the "Turn" portion of our test, Kawasaki said the H2 wasn't intended to be a supersport competitor and referred us to its ZX-10R. But it's our comparison test policy that if a bike wasn't the shootout winner last time we were at the track, and it has not been subject to significant updates, it's not to be included.

We're as disappointed as you that Kawasaki decided not to unleash its supercharged flagship. Maybe next time... — Mark Hoyer

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master of understatement.

So, with Canet making the 1-2 and 2-3 shifts at 12,000 pm instead of 14,000 to help keep the front wheel down, the S1000RR posted a fantastic time, hitting 180 mph in 16 seconds flat and streaking to a terminal velocity of 184.5 mph.

That makes the S1000RR the fastest motorcycle to 180 mph in our test, edging the H2 by a mere 0.04 second. But let's remember the Kawi was bone stock, while the Beemer was fitted with a race-kit ECU (allowed) and an accessory pipe (that no other bike got to run). Did that Akrapovic system give the BMW the two-wheel title? We can't say for sure. But if Kawasaki had let us test the supercharged 300-horse H2R trackonly bike, it wouldn't have been an issue.

McLaren P1

Price: \$1,207,262 Weight: 3300 lb. Horsepower: 727 @ 7300 rpm (gasoline), 176 hp (electric) 0–180 mph: 15.74 sec. Distance to 180 mph: 2635 ft.

When you think of plug-in hybrids, you're forgiven if the million-dollar P1 doesn't come to mind. But that's exactly what this carbon-tub exotic is, powered by a twin-turbo 3.8-liter V-8 with 727 hp and a 176-horse electric motor. While 903 total ponies can reach the forged rear wheels, the electric motor is used primarily to smooth power delivery by filling in the gaps as we for wait for turbo boost to arrive after each shift.

Not that this was a concern at Lemoore. Once Hill learned how to properly launch this missile and extract maximum performance out of the car (which, at one point, involved speaking by phone with an engineer at McLaren's HQ in Woking, England), he got down to work. After putting it in track mode (which lowers the P1 2 inches) and pressing the launch control button, he applied left-foot brake, gave it half-throttle, and then came off the brake while simultaneously giving it full gas the whole way. Hill would upshift the dual-clutch gearbox via paddles while keeping his other hand on the Drag Reduction System button to keep that massive rear wing from deploying into the airflow.

Sound easy? Relatively so, considering all that power. "You could drive this thing to work every day," remarked Hill, who, at 6-foot-2, said he fit well in the P1. That's a lot of power going to just two wheels, and on each run the traction control managed grip so beautifully that the P1 shot down the strip as if flung by some massive



A big thanks to NAS Lemoore and LCDR Darren Fouts, Air Operations boss, for making our test possible. Derek Hill, left, admitted: "I didn't have to work as hard as Canet."

sling. Hill thought he was faster shifting the P1 manually, closer to redline, but the best results were actually achieved in automatic mode, with shifts occurring in rapid-fire succession.

And what were the best numbers? Try 60 mph in 3.2 seconds, followed by the quarter in 10.35 seconds at 149.70 mph and 180 mph in 15.74 seconds. This was our quickest blast of the day, which culminated with a peak velocity of 206.5 mph. Main message here: The P1 hit 180 a quarter second more quickly than our fastest bikes, the BMW S1000RR and Kawasaki H2, and it did so in 107 and 224 fewer feet, respectively.

Impressive, for sure, but rather than making superbikes look bad, this million-dollar Brit underscores the huge bang-for-the-buck advantage that motorcycles maintain over cars. And not just over pricey exotics such as the P1 (whose Volcano Orange paint is a \$10,850 option!) but also over supercar bargains such as the Zo6 Corvette.

Next up: Buttonwillow, for the Turn portion of our test.



Leather is cool. Except in the summer. Until now. The Element jacket and pants are made of TFL cooling leather that reflects UV rays, resulting in a 15 percent reduction in surface temperature compared to standard leather. Plus the leather is waterproof.

Element Cooling Leather Jacket features:

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- > Shoulder vents and rear exhaust vents create flow-through ventilation for hot climes
- > Kevlar stretch panels at inner elbow add comfort and mobility
- > Adjustable waist straps with TPR pulls help fine-tune fit
- Element Cooling Leather Pant features:
- > Removable and adjustable CE armor at knees adds protection
- Stretch panels in knees, waist and back offer maximum comfort
- > Jacket-to-pant zipper attachment included





2015

TEN BEST BIKES



BEST SUPERBIKE

KAWASAKI NINJA H2R

It was a bitter disappointment that Kawasaki didn't bring the track-only H2R to the Party of Speed we threw for it at NAS Lemoore (see page 28), but we must nonetheless honor this force-fed 326-claimed-hp monster for the sheer audacity it represents and the very real performance we experienced at the bike's introduction in Qatar (June). This is "Superbike" with a capital "S" and the most intense motorcycle we've ever ridden. And while this blown batbike might not come with a cape, it does have wings. If it doesn't blow your socks off, your boots are too damn tight.



BEST STANDARD

YAMAHA FZ-09

This was last year's Best Middle-weight, but after hammering our long-termer for a year and trying the 2015 with its refinements, we for Best Standard. It epitomizes sporting all-rounder, serving as a fine commuter, back-road scratcher, or even a trackday mount. Price this year has crept past the \$8,000 mark, but you'd be hard-pressed to find a greater performance-per-dollar value on two wheels. And its three-cylinder powerplant might be the most spirited and fun street engine we have ever sampled, a great helping of its 108 horses and 62 pound-feet delivered right now any time you twist the throttle. It's a bike that does it all and will make you smile every time you ride.





It was a vicious debate down to the last minute in 2014 as to whether the YZ250F or Kawasaki KX450F would take the prize. We went KX for all-out speed coupled with surprising rideability from a 450-class machine. But with that green 450 taking a step backward this year and detail refinements improving Yamaha's YZ250F, the tuning-fork bike gets a boost to the top spot. It doesn't hurt that the YZ is totally rideable by just about anybody, while also becoming a mega-successful championship winner in just two years. With Pro Motocross and Supercross West titles to its credit, the YZ250F is the comeback kid of the decade.



hash out the best all-rounder in the class, we kept coming back to the standard-style 390

Duke. Its 373cc single offers lots of tractable torque and a 40-horse peak in a practical,

affordable package. Pure flexible fun for all kinds of riders.









BEST TOURING BIKEDUCATI MULTISTRADA 1200S

In the past, if you wanted a jack-of-all-trades motorcycle, you grabbed a sporty standard. But now, a bike like Ducati's Multistrada, with the help of its sophisticated electronics and variable cam timing, can be anything you want it to be. Strafing apexes with sportbikes? No problem. Want electronic suspension that snacks on potholes? It does that too. But most surprising is what a great touring bike the Multistrada is. Yes, it leans heavily toward the sporty side of the spectrum, but if you want your two-up touring to be a bit more athletic, it's hard to find a more enjoyable bike for the journey.





There are about 450 different motorcycle models at your pleasure in dealerships right now, in a variety of styles and at a level of excellence that makes it pretty easy to be a new-bike owner if you can afford the price of a couple fancy cups of coffee a day. In 2015, we witnessed the continuation of the trend that sees a splitting of the market between high-end, high-featured machines that dazzle us with amazing performance and those of very low cost and ease of use. While we have always strived to recognize the great motorcycles regardless of capacity or price, we took it a step further this year with a new category: Best Lightweight Streetbike. For the past several years, we found ourselves looking for ways to honor the great bikes of less than 500cc. And now we have it. To make room, since there can be only Ten, we consolidated Sport and Touring into one category to take all bikes with hard bags standard. Our results, after polling the staff, might surprise you. But one thing is for certain: Each of our 2015 Ten Best Bikes is a worthy substitute for caffeine.



HONORABLE MENTIONS

Five more that very nearly made it



KTM FREERIDE

Why should kids have all the fun? For years, manufacturers have built youth-oriented and base-model dirt bikes that have been labeled "playbikes." But what if you want a high-performance grown-up version, a collision of sorts between an enduro and a trials bike, a lightweight machine that makes an average rider feel like an EnduroCross hero who can conquer any trail? That is KTM's Freeride. Well, that and pure fun.

YAMAHA FZ-07

If there is one thing holding the FZ-07 back from snatching a Ten Best Bikes award, it is Big Brother. No, not the Orwellian version but literally its also-budget-minded and performance-oriented FZ-09 stablemate. The 07 packs a surprising amount of fun and performance into a value-priced, \$6,990 package. Power delivery from its 689cc parallel-twin defies the displacement number, while fit, finish, and quality of components exceed expectation at this price.



TRIUMPH TIGER 800 XCx

As adventure bikes get bigger and more powerful, they lose some of the off-road maneuverability and power-manageability that makes them easier to handle off-highway. If this is an important factor for you, consider the Tiger 800 XCx. Output from the 799cc inline-triple is unchanged in 2015, but Triumph has made huge strides in equipping the 800 with a comprehensive suite of electronic rider aids and features, including cruise control, that puts this bike into the same league as the big luxury adventure-tourers but with less bulk.

BMW R1200RT

The spiritual core of BMW is its flat-twin, and despite the deviant engine platforms the Germans have adopted over the decades, nothing says "travel" more than the boxer, particularly in the fantastic R1200RT. Rock-solid handling, high-level comfort, electronic semi-active suspension, and the most responsive and flexible version of that engine make for one of the finest traveling bikes ever to turn a wheel.





INDIAN SCOUT

"What will Indian do next?" That's what we all wondered when the Chief hit the market in 2014. The surprise of this year was the liquid-cooled, 60-degree V-twin Scout, a sporty 1,133cc cruiser that combined approachable size, great power, and sweet handling in a stylish package. With a wide handlebar and a low seat, the Scout is one of the most accessible cruisers on the market.

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AFTER BURN, WE TURN

By Don Canet Photography by Jeff Allen

THE SUPER



e all love the thrill of acceleration and speed. And while WFO sprints down an expansive, perfectly smooth Naval Air Station runway is one way to fuel the need, diving deep into a sharp curve on the binders down to the apex and then carrying a low, hard-driving power wheelie on the corner exit or running full-tilt lean through a 90-mph sweeper is quite another.

In our hot pursuit we headed south from NAS Lemoore to another California Central Valley facility dedicated to thrust: Buttonwillow Raceway Park. While Kawasaki opted out of the cornering component of our test (offering that the H2 and H2R are not supersport bikes; see sidebar page 36), we picked up a worthy replacement in the form of the heavily revised 2015 Aprilia RSV4 RF. Fresh off the docks, the limited-edition Italian V-4 ("1 of 200" for the US) had been held up in customs and missed our 0–180-mph blast.

As they say, better fashionably late than a party pooper.

The Ducati 1299 Panigale S and BMW S1000RR rounded out our trio of newly updated Euro superbikes and joined the all-new Yamaha YZF-R1M flying the flag





for Japan. Also joining us trackside were technical personnel representing each brand. The plan called for a morning session on stock tires and then a midday tire swap onto Bridgestone Battlax RS-10 sport radials in an effort to put all of our bikes on equal footing during comparative timed laps for which I was the test monkey.

Each machine offers a full suite of electronic rider aids, including traction control, wheelie control, and ABS. They all





have quickshifters for seamless upshifts, while the BMW and Ducati also feature clutchless auto-blip downshifting. The Beemer, Duc, and Yamaha each have semi-active electronic suspension that can automatically adjust fork and shock damping on the fly. Tech support from each of the manufacturers assisted us with setup.

A drawing of straws determined the running order in which I rode each bike with our VBox Sport GPS datalogger



FRESH OFF
THE DOCKS,
THE LIMITEDEDITION
ITALIAN V-4
("1 OF 200"
FOR THE US)
HAD BEEN HELD
UP IN CUSTOMS
AND MISSED
OUR 0-180-MPH
BLAST.







See it up close at your nearest Suzuki dealer

So always wear a helmet, eye protection and protective clothing. Never ride under the influence of alcohol or other drugs. Never engage in stunt riding. Study your owner's manual and always inspect your Suzuki before riding. Take a riding skills course. For the course nearest you call the Motorcycle Safety Foundation at 1-800-446-9227. Suzuki, the "S" logo, and Suzuki model and product names are Suzuki Trademarks or ®. © Suzuki Motor of America, Inc. 2015. *MSRP shown does not include tax, title, destination charge, or options. Dealer prices may vary. Contact your Suzuki dealer for details. Not available in California. At Suzuki, we want every ride to be safe and enjoyable.





"THE POWERHOUSE BMW ENGINE COMBINES SOME OF THE YAMAHA'S SILKY DELIVERY WITH A TOUCH OF THE DUCATI'S ANIMAL NATURE."

attached before handing it over to Editorin-Chief Mark Hoyer, Senior Editor Blake Conner, and guest tester Tom Montano for collective riding impressions.

First in the rotation was the Aprilia RSV4 RF, and it established the time to beat. Blessed with a silky smoothrunning engine that delivers a broad torque spread and sound all its own, the RF speaks racing pedigree both audibly and with loads of chassis feedback. While livelier than the others with constant chassis movement, it instilled confidence to be pushed ever harder as I quickly found the limits of the Bridgestone street/trackday radials. Following a few heart-stopping rear slides, I thumbed its bar-mount button to select a higher level of TC (up from level one to three) to finish the five-lap stint with a bit less drama before handing the bike off.

"This may be my favorite superbike engine," Hoyer remarked. "The V-4 note and broad power making for a thrill on every corner exit." While the Aprilia's fast lap would ultimately be eclipsed by

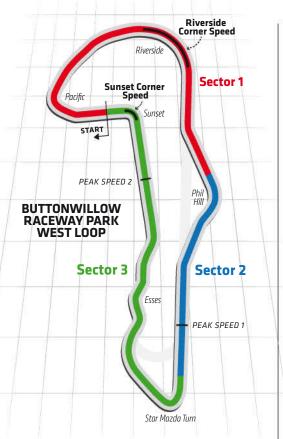




LAP ANALYSIS: BUTTONWILLOW, WEST LOOP

We used a VBox Sport GPS datalogger to analyze each bike's quickest lap and broke the 1.83-mile course into three parts. Sector 1 involves trail braking into Pacific, followed by a TC-tapping exit drive as the radius opens and leads into Riverside. In Sector 2, you'll crest Phil Hill and then stretch the throttle cable using every ounce of power as you accelerate through a left kink onto the fastest part of the track. Sector 3 involves a test of second-gear midrange grunt as we power out of the track's tightest turn, thread through the esses, and brake hard into Sunset. Average corner speed through Riverside and Sunset is a good indicator of our confidence in that particular bike's edge grip. Peak speed on the two fastest straights is as much about rider confidence through the preceding corner as it is a measure of that bike's power and acceleration. How does the R1M post the best time? Chalk it up to the good performance in Sectors 1 and 3, plus high peak speeds on both straights. —Don Canet





LAP TIME DATA • BUTTONWILLOW RACEWAY PARK, WEST LOOP • 1.83 MILES								
BIKE	Lap Time	Split 1	Split 2	Split 3	Peak Speed 1	Peak Speed 2	Riverside Average Speed	Sunset Average Speed
Aprilia RSV4 RF	1:10.31	22.23	19.60	28.48	142.04 mph	130.80 mph	91.87 mph	63.04 mph
BMW S1000RR	1:09.91	22.18	19.36	28.37	144.53 mph	134.32 mph	91.83 mph	63.71 mph
Ducati 1299 Panigale S	1:10.28	22.33	19.62	28.33	144.77 mph	136.66 mph	90.69 mph	63.83 mph
Yamaha YZF-R1M	1:09.73	21.92	19.69	28.12	145.90 mph	135.58 mph	91.85 mph	64.00 mph

the others, we enjoyed every moment spent in its firm saddle. "Throttle response was nearly telepathic, and blipping for downshifts or reacting to rear wheelspin is one of the great trackday pleasures," Hoyer added.

Climbing onto the reworked S1000RR and immediately feeling comfortable at speed illustrates the progress in refinement BMW has achieved since the Bavarian brute's 2009 debut. Its TC/WC implementation is now worlds more seamless in operation, and its auto-blip downshifts feel like cheating. That being said, it's still a monster on the gas that will raise a nose despite electronic wheelie restraint. As with the Aprilia, the BMW displayed chassis agility that made for less work through the track's

fast side-to-side transitions.

"Shooting out of the Mazda Hairpin and into the esses was my favorite place on the track aboard the S1000RR," Conner noted. "I could pick up the throttle quickly and grab a short-shift before threading the bike through there easier than on any other bike." Veteran Isle of Man TT racer Montano concurred: "The chassis worked well with good feel, and the engine control was nice, considering it's a 1,000cc conventional-firing-order beast. The whole package was well balanced, much more so than I expected."

The BMW's brakes are as formidable as is its speed, providing fantastic initial bite that inspires confidence without being overly aggressive. But as in the

past, it's the Beemer's raw power that carries the conversation in the pit box. "This powerhouse engine combines some of the Yamaha's silky delivery with a touch of the Ducati's animal nature," Hoyer enthused. "Low-to-mid-revs power has been boosted over that of past RRs, and it just doesn't quit as you catapult toward the shift light."

Riding the new punched-out 1299
Panigale S at the world launch in
Portimão, Portugal, gave me an idea of
what to expect, but testing it back to
back with these smooth-revving fours
shows just how visceral the big twin is.
Every pulse of those coffee-can pistons
ringing through the hands and arms
was like gripping a bull by the horns and
left me feeling more physically spent



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vanceandhines .com





"IT SNORTS, GROWLS, AND ROARS AND FEELS LIKE IT CAN BARELY CONTAIN ITSELF. BUT, THANKFULLY, THE PANIGALE S DOES CONTAIN ITSELF—YES, JUST BARELY."

after a half-dozen quick laps. Its lower rev ceiling saw the Duc running a gear higher in several corners, and also the bike required more shifting during the lap. Upshifts under full power produced a chassis-unsettling jolt at times while the auto-blip feature worked superbly, allowing full focus on brake-lever

pressure on corner approach. I felt certain the 1299 was on pace with the quickest bikes here, but perhaps I was deceived by the amount of effort I put in and lively chassis movement that came when I pressed the bike hard.

"This is the wild animal of our test," Hoyer assessed. "It snorts, growls, and



And while the Yamaha YZF-R1M was the third bike I rode in the rotation, I saved it for last here because it was the quickest. And what a relative relaxed ride it offered in stark contrast to the other bikes. Its ultra-composed chassis delivers unmatched confidence on every inch of a lap. Its engine's crossplane firing order emits a subtle vibe through the grips that delivers a sense of tractability and rear grip I would normally equate with a V-4. I also imagine the R1's excellent electronics sense the same and are not, perhaps, forced to work quite as hard as the others as the processors help meter out the right amount of juice to propel the bike forward with minimal rear-slip or front-lift drama.

If there's a caveat to the R1's bedrock





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High-end sportbikes like Yamaha's YZF-R1 and R1M, the Aprilia RSV4 RF, BMW S1000RR, and the Ducati 1299 Panigale S offer the capability to download riding data from the bike's ECU right to your computer, or even your smartphone for some. Then you can review your trackday performance, corner by corner, lap by lap, in the comfort of your home or at the coffee shop with friends. This is fabulous—it is a personal coach who observes and measures your performance.

Be prepared for possible disappointment. When Eddie Lawson first worked with a data system on a GP bike, he reportedly said, "I hate that thing! Where I think I've got the throttle open 100 percent it's telling me it's only 25 percent."

Imagine the possibilities for self-improvement. Instead of spending a trackday trying to remember what you did on your best lap, such a system tells you exactly what you did on every lap. You can also overlay stored laps for detailed comparison.

Now imagine a website from which to download laps of your favorite tracks by top racers such as Josh Hayes or Max Biaggi or Chaz Davies (somebody hurry up with that!). Data systems offer tremendous possibilities to imaginative software writers. Stand by to be amazed, and get started now at your local dealer! - Kevin Cameron

composure it's the level of steering effort needed to initiate turn-in and make sideto-side direction changes.

"What the R1M demanded for its beautiful composure was planning and precision on the part of the rider in the sense that it was necessary to accurately hit turn-in and apply concerted effort to really steer the bike down to the apex," Hoyer said. "But I'll pay the price any day: fastest lap time, zero drama. Just an absolutely buttoned-down feeling as if it somehow applied suction to the earth through its contact patches."

Although the R1 spotted the other bikes peak power on the CW dyno, the Yamaha proved the most effective at putting ponies to the road. "On all of the other bikes you can feel the intervention from TC and wheelie control, whereas on the R1 it's so smooth and well integrated it doesn't make itself as easily detected," Conner said. "On the Yamaha, I had a lot more faith opening the throttle earlier and not having to worry about any

inconsistencies in the wheelie control or TC."

Perhaps being fashionably late to the electronics revolution has played into Yamaha's hand. The company's own work in MotoGP and Superbike racing, as well as the studied observation of what other manufacturers' superbikes offer for the street, has allowed the tuning fork folks to implement the best system—and it's been made very user friendly.

No doubt, electronics have transformed the superbike and trackday experience. Traction/wheelie/slide control, ABS, and data acquisition/GPS make us into faster, safer riders. The addition of GPS/inertia-based track mapping and data acquisition allows for rapid, no-BS analysis of your efforts. And, if you open your mind to the digital feedback, the path to better laps is clear.

In 2015, the YZF-R1M offers the best mechanical package with the finest electronics we've ever sampled. Think of it as the faster way to go faster.



THE R1M'S ULTRA-COMPOSED CHASSIS DELIVERS UNMATCHED CONFIDENCE ON EVERY INCH OF A LAP.







2016 HONDA RC213V-S

WHAT DO I REALLY THINK ABOUT HONDA'S STREET-LEGAL MOTOGP MACHINE?

By Kevin Cameron

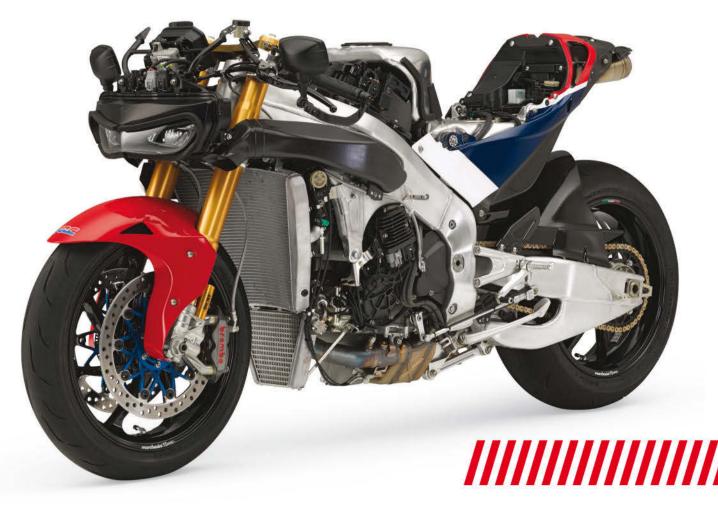
here's so much critical chatter about this new Honda that I'm weighing in as well. In general, people seem disappointed that the RC213V-S is not a take-no-prisoners pavement ripper, equivalent to a Hayabusa with 650-hp turbo kit, or Kawasaki's supercharged 500-plus-pound H2. Orders began on July 13, and these \$184,000 bikes will be hand built by small teams at the rate of one per business day through the end of 2016.

A speed kit for closed-circuit use only is another \$14,000, available only in Europe. US spec is a claimed 101 hp at 9,400 rpm. Marc Marquez's racebike, for the record, is good for about 240 at 16,000. With the kit, the RC213V-S is said to produce 215 hp at 13,000.

The RC213V-S is today's equivalent of the late 1980s Honda RC30—a handbuilt roadracer that you can ride on the street. Roadracing requires sophisticated suspension, and this Honda has it. In







MOTOGP BIKES WEIGH WHAT HONDA'S ENTRY-LEVEL CBR300 SINGLE WEIGHS. PAVEMENT RIPPERS LIKE THE HAYABUSA TIP THE SCALES NORTH OF 500 POUNDS TO SURVIVE THE HAMMERING OF STREET DRAGS AND BURNOUT CONTESTS...

roadracing, you get one start from a clutch then it is changed. Pavement rippers get big, heavy clutches good for 20 or 30 burnouts.

A roadrace bike is built down to the class minimum weight to maximize acceleration and maneuverability while minimizing rider effort. MotoGP bikes weigh what Honda's entry-level CBR300 single weighs. Pavement rippers like the Hayabusa tip the scales north of 500 pounds to survive the hammering of street drags, burnout contests, and trackday one-upmanship (to say nothing of heavy mufflers and catalyzers).

To legally ride a roadrace bike on the street, it must pass applicable sound and emissions requirements. Some private individuals have welded 10 pounds of grenade glass-packs on the ends of a Yamaha TZ750's four pipes and taken it to the street, but Harleys won all the rollons because the TZ's torque curve began at 9,300 rpm. Cruise the strip at 9,300? I don't think so. They also got tired of



replacing the six \$11 steel clutch plates after every hot start (which is why top riders chugged rather than blazed their big TZs out to practice from 1974–1984). Remember, 11 bucks bought a nice dinner in the 1970s.

But when a major manufacturer risks its name on a roadracer for the street, it has to meet emissions and sound regulations without question, and that doesn't mean crude glass packs that blow their stuffing and get real loud after a few rides. Look over existing photos of the RC213V-S and tell me where you would put the bulky catalyzers and mufflers. Catalyzers get

hot because their purpose is to burn off any remaining carbon monoxide or unburned hydrocarbons. Want to sit on the one that exits from the seatback? Look under the bike: Honda engineers have filled that small space with a cat and muffler, but streetbikes are designed from the start to carry street equipment. Roadracers are not. When the RC213V-S was given as much catalyzer and muffler as there was room for, it wouldn't meet sound or emissions regulations at its own proper peak rev ceiling of 16,500 rpm. It wouldn't pass at the 13,000 rpm that you get with the \$14,000 speed kit. And it wouldn't pass at 10.000. What could Honda do? Have this bike tow an exhaust-treatment trailer? So the engineers de-rated the engine until it did pass.

We don't know how long the racebike's pneumatic valve system seals last, but it seems unlikely that they last a lot longer than the 3.6 races required from each engine under the five engines per rider,



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per season rule. Are you ready for a 1,100-mile top end overhaul interval? Also, the pneumatic valve system is good for about an hour of running after it's pressurized by the little box on casters. Throw in a trained technician to do it all perfectly. A few distinguished older residences still have coach houses behind, with an upstairs apartment for the coachman and his family; maybe the pneumatic valve tech can live up there in these remnants from the 1890s.

So we get no pneumatic valves for the street. You get metal springs, as used on the "production racer" that Nicky Hayden rode last year, estimated to be 30 hp down on the real thing.

Only one person on the Honda team is permitted to rebuild the seamless transmission—a job that is probably performed after every race weekend in conditions of tight security. A couple of years ago, Honda offered to lease such transmissions at \$300,000 per year, under its own direct supervision. Do I hear any bids? Can both techs live in the coach house apartment?

No seamless transmission. You get a conventional six-speed drum-and-dogs-shifted gearbox.

Exotic carbon-carbon discs and pads are on every MotoGP bike because they continue to work at 1,600 degrees Fahrenheit and their lightness makes steering quicker—especially at very high speed. But look in any MotoGP garage on Sunday and you will see wheels with rain tires and regrettably heavy steel discs already fitted and calipers

with dry-break hydraulic connectors, equipped with two or three grands' worth of carbon pads, ready to click into place in case of rain. Just sitting there, in case. Carbon has to be hot to generate useful friction, and that's hard to achieve with direct water-cooling by Mother Nature.

So no carbon brakes for the street, unless you can provide a chase van with the alternate wheels and calipers on board, plus more technicians to quickly install them. So you get steel Yutaka Giken discs.

Everything else is really nice racebike stuff. Each caliper is \$8,500. Real MotoGP suspension for how much? The good World Superbike fork used to be 30 grand. It all adds up quickly. Beautiful stuff. People with a lot of money might start out with the basic 26,000-squarefoot McMansion and the expected private jet, but a few become curious

about more imaginative ways to convert their Swiss francs into personal satisfaction. When I was able as an FIM tech inspector to lay hands on real GP bikes at Laguna Seca in 1988, I saw close up that they are beautiful things, made to the highest possible standards. They make Bimotas seem, well, crude. I felt privileged. Beauty of that kind doesn't appeal to everyone, but it appeals to me.





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BY RAY NIERLICH



BLIP DOWNSHIFTS?

When I learned to ride dirt bikes in the mid-1970s, an experienced buddy taught me that the correct technique for downshifting was to blip the throttle before releasing the clutch during downshifts, which he called "double clutching." I have been using this technique for 40 years now on all my motorcycles, and I notice quite a few other riders do it as well. I reason that this makes downshifting smoother, but lately I've started to question the possible consequences, such as increased wear on gear dogs. My 1987 Honda Magna has begun slipping out of second gear, and I've read online that rounded off gear dogs is the likely cause. This is apparently a fairly common transmission problem with that era of Honda street bikes. Do you think that my double clutching practice may have caused or accelerated the gear wear? I'm also wondering if there is any real value to blipping the throttle during downshifts (besides sounding cool) and what are the other potential negative effects?

> ROYSON PARSONS CYCLEWORLD.COM

Not your fault; you ride 'em, you break 'em. When shifting up, or down, the best practice is to attempt to match the differing speeds of the rotating bits and reduce loading as much as possible to minimize clash between said components. A true double clutch is when the clutch is briefly reengaged, in neutral, before selecting the next gear. This is impossible to do with a sequential shifting gearbox as fitted to all motorcycles. We do what we can by reducing throttle on upshifts and blipping the throttle on downshifts. Practice smoothness when shifting to minimize wear. If it feels good and sounds good, it is good.

ODE TO AVGAS

As the owner of several older motorcycles and a few pieces of gas-powered lawn equipment, I find myself constantly fighting the effects of ethanol in today's pump gas. My solution has been to pick up some

low-lead avgas from my local airport. It has a long shelf life, doesn't absorb water, and allows my almost-40-yearold BMW to run better. All my smaller engines start and run without the annual rebuilding of the carburetors. A few well-respected shop owners and tech gurus I've talked to pooh-pooh the idea because of the illegality of it and the lead content, but for me, "The proof is in the pudding." Yesterday, I pulled my old Kawasaki KLX250 out of the shed. It probably hasn't been ridden more than 10 miles in 15 years, but it started on the second kick and ran flawlessly. Also, the original plastic gas tank mysteriously developed cracks after only two years, probably because of the ethanol. I know that Big Brother is probably reading this note, but I would appreciate your comments on the matter.

> JOHN MORGAN HOCKESSIN. DE

About 10 years ago, some 50-plus-year-old avgas from stored WWII-era bombers and transports was drained and sold for use! That avgas was slightly different from the current 100 lowlead avgas, but any will last in storage almost indefinitely in a dry climate. The problem is the lead in the fuel. The EPA doesn't want millions of Americans using leaded fuel daily in their Escalades. The only reason pistonengine aircraft are still allowed to use it is they haven't found anything else that works. Evidently having fuel boil off at altitude isn't a desirable trait.

The ethanol pump fuel that has been foisted on us has many bad side effects, including being absorbed by most plastics (sorry, Ducati owners). There was a huge uproar when the first boaters to use it had their fiberglass fuel tanks dissolve and it glued their engines together. Try to find and use nonethanol fuel. Marinas have to have it for boat use. Failing that, use fuel stabilizers all the time. Drain the mower tank and carb dry for storage. Maybe if enough people vote with their pocketbooks, we can put this whole ethanol nightmare behind us.

GOT A MECHANICAL OR TECHNICAL PROBLEM with your beloved ride? Perhaps we can help. Contact us at cwservice@cycleworld.com with your questions. We cannot guarantee a reply to every inquiry.



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BASIC SPECS: Simplicity is the name of the game. Nearly 35 years ago, Yamaha introduced the 1981 Y-Zinger, renaming it the PW50 in 1991. It's been virtually unchanged (other than color) since. This nearly indestructible little dirt bike has an air-cooled 49cc two-stroke motor, a single-speed transmission with a centrifugal clutch, and maintenance-free shaft drive. An adjustable throttle stop gives parents the ability to manage power output. Handlebar levers operate front and rear brakes, and a seat height of only 19 inches makes the PW50 ideally suited for younger riders. With 10inch wheels and a feathery weight of only 82 pounds, this little Yamaha is dead-nuts reliable, with minimal maintenance needs.

VHY IT'S DESIRABLE: Who doesn't love the ring-ring-a-ding sound of a two-stroke? It's music to our ears, but the PW is still quiet enough for the campground. This smallscale MXer, one of the easiest bikes ever to ride, will bring dusty smiles to the faces of your little ones. Because the Pee-Dubva lacks a manual clutch, your kids can focus on improving their riding technique. Chad Reed, James Stewart, and Ricky Carmichael all spent time on PWs in their youth.

THE COMPETITION: There are some good alternatives. Basically, you must decide between the PW50 and four-stroke offerings such as the Honda CRF50 and Yamaha TT-R50E. Although the four-strokes are heavier (more than 110 pounds) and have higher seats (21.9 inches), these models both have electric start, which makes it easy to fire up your bike after a tip-over. But what good is that if you can't pick up your bike?

MORE ETHANOL LOVE

I live in Nebraska, and ethanol fuel is sold at every gas station. I try to go to stations that have regular unleaded fuel without ethanol, but sometimes out on the road in this part of the US, ethanol is the only fuel available. Are there any fuel additives you would suggest for my injected 2009 Kawasaki Vulcan to keep the fuel injectors clean and prevent carbon buildup?

> "NEBRASKA MIKE" SIMON CYCLEWORLD.COM

Ethanol bites, but if your bike (or car/truck/tractor) has EFI and is in regular use, the side effects aren't usually noticeable. Ethanol does lots of bad things, but fuel-injector deposits and carbon buildup aren't even on the radar. The most common problems are corrosion and varnish deposits in the fuel system, primarily the rusting/dissolving of the fuel tank, and varnish in carburetors and on inlet valve stems. These bad effects stem from how quickly it evaporates, how easily it absorbs moisture from the atmosphere, and the phase separation it goes through after as little as six months. Try to find non-ethanol fuel. Write your congressman. If stuck with ethanol, run your tank all the way empty before storing for the winter. Failing that, fill it to the brim with stabilizer in it. Any of the brand-name fuel stabilizers sold for ethanol will help negate the bad side effects.

SWEET SISTER

. My sister passed away a year ago. She left me her 2001 Kawasaki ZR750S. I would dearly love to take it for an occasional ride for sentimental reasons. The problem is that my 29-inch inseam isn't compatible with the seat height. I've checked the Internet and haven't been able to find any aftermarket lowering kits. Any suggestions would be appreciated. What do you think of cutting the rear spring down to reduce the preload?

> JIM SARGE LAKE ORION, MI

Why isn't my sister that cool? First, I don't advocate lowering this or any other streetbike, especially wide ones with four-cylinder inline engines. Wear proper boots and

ASK KEVIN

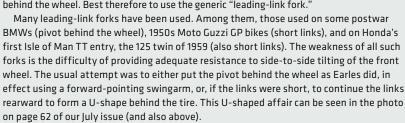
AN EARLES FORK? NOT!

Please let Technical Editor ■Kevin Cameron do more technical editing. I'm sure he would have corrected the erroneous labeling of the Greeves leading-link fork in "Motocross Memories" (July) as an "Earles" fork. The Earles patent of 1953 specifies a link pivot behind the wheel, which clearly is not the case with the Greeves. BMW and MV Agusta licensed the Earles design, but Greeves did not.

> MICHAEL MOORE SAN FRANCISCO, CA

People have gotten into the habit of calling any leadinglink motorcycle fork an Earles fork. It is clear, as our correspondent points out, that in section 35 of his patent Earles specified a link pivot

behind the wheel. Best therefore to use the generic "leading-link fork."



The English have always had a thing about constant wheelbase, as seen in the patent. Hmm, let's check to see what kind of fork is used in World Superbike, MotoGP, British Superbike, etc. Oh, my, the use of the telescopic fork appears universal, even though such forks are notorious for wheelbase change.

In the later 1940s and early 1950s, there was justifiable dislike of telescopic forks in certain circles, mainly because of their flexibility and lack of stiffness. Gilera went so far as to make for their four-cylinder racers a single steel weldment of upper and lower steering crowns to more strongly hold the two fork tubes parallel under stress. Anyone who has familiarity with British teles of the 1950s and even '60s knows that you can hold the front wheel between your knees and turn the handlebars a considerable distance either way-and when you release the bars, much of this deflection will remain! -Kevin Cameron

slide that butt off the seat! Valentino Rossi can still do it; so can you. But if you must: Buy some Muzzy or Soupy lowering links for the rear and raise the fork tubes in the triple clamps a bit. The kickstand will need shortening to match. Don't take any passengers on a ride. Don't have a beer and forget you went and lowered it. Do put a warning label in big letters across the gas tank for your unsuspecting buddy when you loan it to him.



I have been wondering for some time about when an engine modification requires remapping of the computer. This of course applies to modern EFI bikes. For example, I installed Yoshimura slip-on exhausts and a K&N air filter on my 2008 Hayabusa (exhaust manifold and catalyst unchanged), and it runs fine. I assumed the computer, which monitors a number of engine parameters, would



make the appropriate changes to the fuel mixture, timing, etc. to keep the engine running well. I realize this approach has its limits, but it seems like engine modifications that are not major, like the ones I made, should be accommodated by the computer. Maybe another way of asking the question is what sort of modifications require remapping?

> **BOB GILES** ESCONDIDO. CA

It really depends on the particular bike and expectations of the owner. If it runs well by the seat of your pants, it isn't all that far off from optimum. It might not have been very optimum stock. Now as far as your bike being the underpowered, poorly built, and engineered wimpy thing it is: It probably never sees super highcombustion temps or WFO throttle for sustained periods (if you still have your license). If your motor wasn't quite as bulletproof (read: air-cooled) or was of lesser capacity, it would have to work

harder and might be more likely to see exhaust valve and seat longevity issues resulting from the higher exhaust temps.

When you ask a manufacturer rep this question, any modification requires a remap. But they have to say this to please their corporate bosses (lawyers). In the real world, I'm betting south of 50 percent of modifications get a proper remap. If a modern EFI bike has few, if any, noticeable drivability problems before a minor modification, such as a slip-on pipe or air filter upgrade for example, it most likely will still run well and longer than any reasonable expectation of the average owner. If the bike's EFI incorporates an oxygen sensor for feedback, odds are it will have a wider ability to compensate for mixture changes from modifications.

HOTTER THAN HELL DIAVEL

My 2013 Ducati Diavel temperature indicator goes off scale in stop-and-go congested traffic and simply reads "HOT" without warning me to stop and/or to turn the engine off. Can you please give me your thoughts on this situation? I did pass this question to the Ducati mechanic without really getting a satisfactory answer.

> WALID C. ASSAF BEIRUT. LEBANON

It's up to you to know to stop and turn the poor thing off. Serious damage can and will be done if this scenario is ongoing. Ducati had a service bulletin regarding stuck thermostats on this model. This should be the first thing checked. If still under the Ducati twoyear warranty, you're covered. If you are slightly out on time, they may goodwill some or all of the repair. Ducati also had an issue with coolant a few years ago. The coolant was formulated too strong and will corrode right through the water jacket into the exhaust port. Look in the coolant reservoir window. If the coolant is blue, it is bad. Change and flush the coolant thoroughly ASAP. If it's pink, it is the newer spec stuff and is okay.

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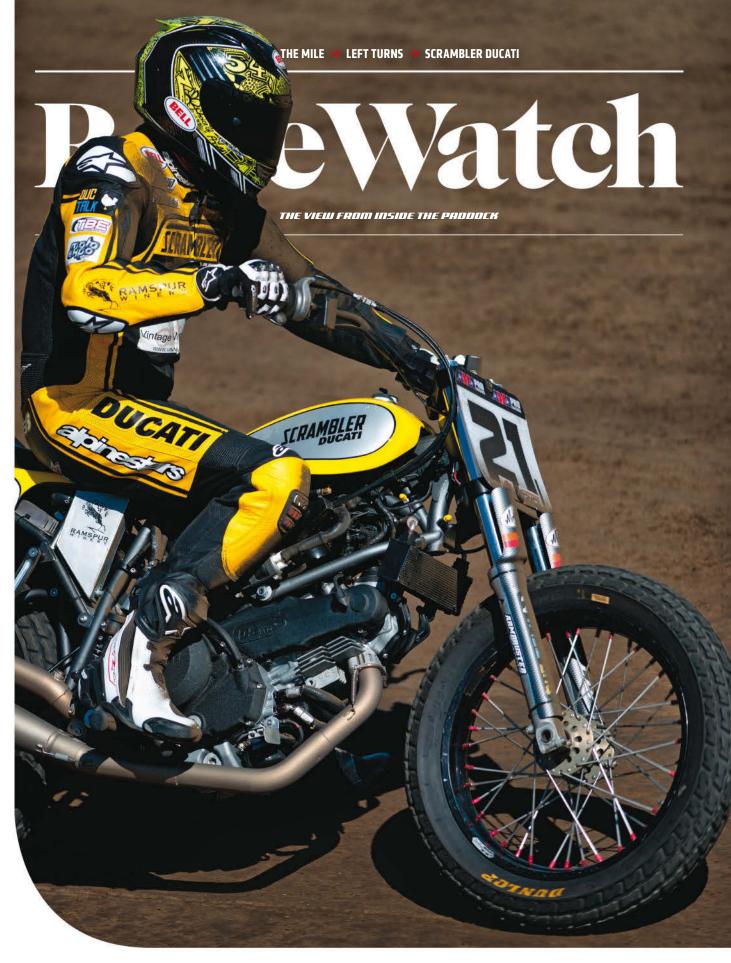
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MILES AWAY

Where World Champion Troy Bayliss drowns in the depths of dirt track and the world learns just how good these guys really are **By Gary Inman**

> fter being on the ropes for 30 years, the most American of motorcycle sports is making an unlikely comeback thanks to a high-profile list of international heavy-

weight allies. Now dirt track is blinking in the spotlight, unaccustomed to anyone giving a gosh darn about it. Valentino Rossi has his ranch and a Harley-Davidson XR750 in his private garage; Marquez brothers Marc and Alex as well as Tito Rabat (that's all three current Grand Prix champions, by the way) let it hang out at the Superprestigio extravaganza in Spain; and, most recently, Troy Bayliss is taking on

the Grand National Championship's

miles mounted on a tire-shredding Ducati twin.

Social media static of a spotless doctor roosting rural Italy with a steel shoe on his left foot is turning riders of all abilities onto the joyous beauty of going fast and turning left. The Marquez-endorsed Barcelona invitational has educated European roadrace fans about the spectacle of a fistfight-in-a-phone-booth indoor







Although we have no doubts about Bayliss' ability, AMA Pro Flat Track miles are a highly specialized discipline.



short track. But these examples are really just satellites of love orbiting Planet Dirt Track. With all due respect, those Euro icons are playing at it; only the Australian has truly crash-landed dead center into the insular world of AMA Pro Flat Track. Unfortunately, as analogies go, this one is prophetic. And this is how it came about...

"Basically, you could say it

started three years ago when I did some work with Bell and we went to Chuckwalla [Valley Raceway in California] and did some riding down there," Bayliss explains between phone calls back to Australia to see how his son's own dirt track racing is progressing. "I met JD Beach and Hayden Gillim, and we went out to Kentucky and did some video footage on their little short track.

I grew up doing a bit of dirt track, and since I retired I've supported our local club in Taree and things have progressed from there. After years of racing for the best teams in the world, working out of air-conditioned pit boxes, I found myself back in the dirt and working on my own bikes sometimes, so it proves that I must love it."

He certainly looks like he loves the sport—and America. We meet in a budget hotel in Sacramento. It's Friday afternoon, a day before the Sacramento Mile and just five days after the Australian's pro dirt-track debut. The 46-year-old is in a great mood having recently arrived from a multi-state, weeklong trip with his team co-owner, David Lloyd, and Lloyd's two children. The four had traveled in the race truck from Springfield, Ohio, to California. The Aussie stopped to buy a pump-action shotgun en route. He's even dabbling with chewing tobacco. But Springfield was a something of a shock for Bayliss. He had serious hopes of making the 18-rider main. He wasn't even close. Like he says himself: "You can make it sound easy. It's an oval and it's only one mile, but, of course, there's a lot





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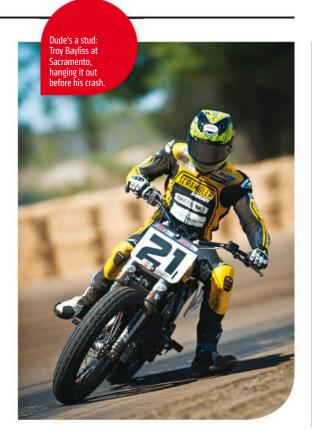
more to it than that."

Dirt-track people are good at making their sport appear exceptionally lo-fi. Steel frames; right-way-up forks; bias-ply tyres; pushrod engines winning races! What is this, 1972? That's what the outsiders assumed and some even intimated. The thinking: Bayliss is a world champion and a MotoGP race winner. He's also been winning on Australian dirt tracks on a regular basis. Surely he was going to show those inbreds what time it was. Bayliss admitted he had hopes of making the main, so the difference between his lap times and those of the current cream were unexpected.

It takes time to get up to GNC speed, and Bayliss hasn't had it. He is fearless and possesses the confidence of age and experience, knowing he has nothing to prove. His reputation and legacy is bombproof. So if he wants to

change disciplines and battle two younger generations of hungry badasses racing for their next tank of gas, he will. I can't name another rider of his stature who would. But none of that helps when you have four minutes of free practice before qualifying starts. That's right, four minutes on a track he'd never lapped on a bike he'd tested once, against the world's best.

"I've never ridden a big bike [on the dirt]," Bayliss admits. "I'm riding a Ducati 1100, and when you hop on it it's completely different [from a 450 dirt tracker]. If I had to describe it, I'd have to say they're like a NASCAR. They're built to do one thing, and that's go left and go left fast. You talk to anyone who has driven a NASCAR and they say they don't even want to go straight down the track. The first time I got on the bike, I thought it was an alien. The first thing you notice







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is your left foot is way back and up high and your right foot is in a half-normal position. The bikes are big and just need a different way of riding."

Bayliss showing an interest in racing in the States was enough to bring a whole team back from the brink of extinction. Lloyd Brothers has been plowing a lonely furrow, running Ducati twins in the GNC since 2009. They won a National race with Joe Kopp in 2010 and fielded multiple champ Jake Johnson in 2014 but had run out of steam and support and were sitting out the 2015 season until Bayliss came on board. Now they're running a two-rider team, with national number 10 Johnny Lewis on the other bike. Sponsorship is coming from a wealthy Ducati fan and the Ducati importers, the latter because a GNC framer can be made to look like Ducati's new Scrambler streetbike or at least as much as Jorge Lorenzo's M1 looks like a 2015 YZF-R1. Who'd have thunk dirt track would actually benefit from road bike marketing synergy? Me neither. Thank goodness for retros.

The buzz around Bayliss' arrival is doing exactly what it should: turning on a whole different demographic. The Ducati fans are easy to spot inside Sacramento's fairgrounds. And the Italian team looks at least as professional as any others.

What they can't buy is time, and, again, it's what Bayliss needs. Unlike Monza or Laguna Seca, a dirt track is ever changing and with it the lines riders must use to improve their lap times. Bayliss's teammate Lewis instinctively sniffs out the traction and posts top-four qualifying times in a field of 30 riders while Bayliss is 25th. Then the Aussie drops to 27th. Lewis makes the cut in his heat race.

transferring to the main. Bayliss doesn't and faces an 11-rider semi that only three will escape from. And he's on the back row.

Within two laps of his semi he's on the deck, sliding toward the air fence, his ankle broken, the dream, if not over, on hold for a couple of months.

It's not what anyone needs, least of all the 40-something Aussie, but if it teaches us anything, it is these two lessons: Dirt track is resilient. It's been under a metaphorical rock for more than the lifetime of most of the current racers, yet, when it's called upon, it can welcome a world champion and, a few days later, create a memorable race for X Games TV fans. And second. it shows the world just how quick those pro flat trackers are.

I hope Bayliss mends quickly and strongly, comes back, and makes a main. And if he does, it'll be a hell of an achievement.

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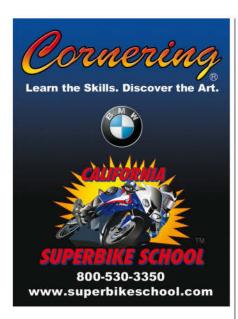


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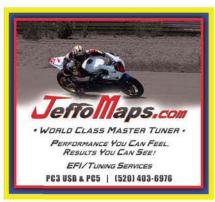




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